



Update on Iodine 131 in Philadelphia's Drinking Water

Q&A

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What is Iodine-131 (I-131)? Iodine-131 is a radioactive form of iodine. When certain atoms disintegrate, they release a type of energy called ionizing radiation. This energy can travel as either electromagnetic waves (i.e., gamma or X-rays) or as particles (i.e., alpha, beta or neutrons). The atoms that emit radiation are called radionuclides; e.g., radioactive iodine, cesium, and plutonium.

Where does Iodine-131 come from?

Iodine-131 is a byproduct of nuclear energy production. It is also used in medicine to diagnose and treat disorders of the thyroid gland.

What is RadNet?

RadNet is a national radiological surveillance program, run by EPA, which monitors environmental radioactivity in the United States in order to provide baseline data during routine conditions and provide data for assessing public exposure and environmental impacts resulting from nuclear emergencies and large scale natural disasters. RadNet collects and analyzes data on radionuclides in air, rainwater, surface water, milk and drinking water samples.

What actions has PWD taken since the EPA RadNet data, published in April 2011, showing Philadelphia results among the highest levels for I-131?

Philadelphia's drinking water is safe to drink. An infant would have to drink almost 600 liters of water at 2.2 pCi/L (April RadNet level), to receive a radiation dose equivalent to a one day's worth of the natural background radiation exposure that we experience continuously from natural sources of radioactivity in our environment.

Although the RadNet results indicate there is no risk to public health, PWD has not ignored the recent upward trend in I-131 levels. In response, PWD has reviewed the RadNet database in consult with EPA and PaDEP and developed a Radionuclides Joint Action Plan (PaDEP, EPA, PWD) in April 2011. PWD is conducting a multi-phased watershed sampling and assessment program for I-131 with the goal of quantifying I-131 in the Schuylkill River watershed, Philadelphia's water supply. PWD also continues to work with the EPA and PaDEP Radiation experts to better understand potential sources of I-131 which may be impacting the watershed.

PWD Iodine 131 Multi- Phase Study Approach

Phase 1 of PWD's watershed sampling program, which was an immediate assessment of I-131 & Gross Beta Radiation in surface water and drinking water, was conducted April 12, 2011 through May 5, 2011. Results for drinking water samples indicated average Iodine -131 levels well below 1 pCi/L. As a result of these low levels, application of activated carbon, which was initially applied at our Queen Lane Water Treatment Plant as a precautionary measure in immediate response to the RadNet data, was discontinued on May 5, 2011.

A more comprehensive sampling program to characterize I-131 concentrations in the Schuylkill Basin will be conducted in the next two program phases.

- Phase 2- Iodine-131 Drinking Water and Source Water Initial Characterization (45-day Snapshot)
- Phase 3- Iodine-131 Drinking Water and Schuylkill River Basin Characterization Study (1-year duration)

How often is the water monitored? At what locations?

PWD monitors its drinking water every day at its three water treatment plants and at points throughout its 3,000 mile delivery system. Our water is consistently better than Safe Drinking Water Act (SDWA) standards and has always met all health standards. Iodine-131 sampling is not required under the SDWA, however, PWD has been working with the EPA since 1989 on a voluntary basis to provide quarterly samples of river water and drinking water for analysis of various radiological elements.

PWD also continuously monitors water quality throughout the Schuylkill and Delaware River watersheds. PWD has a nationally recognized Source Water Protection Program, which embodies the department's multi-barrier approach to ensuring the safety and quality of Philadelphia's drinking water. Philadelphia's Source Water Program staff work closely with the department's treatment plant managers and operators to anticipate and respond to emergencies and challenges to conventional treatment techniques. The Source Water Protection Program takes a holistic approach to developing a thorough understanding of Philadelphia's water supply characteristics, including water quality conditions, major sources of actual and potential contamination, water availability, flow patterns and management practices, and tidal and reservoir impacts.

How do the levels of iodine-131 found most recently compare to past measurements?

EPA detected low levels of I-131 in a number of drinking water samples before and since the Japanese nuclear incident. The EPA sample results for I-131 published in a April 2011 RadNet posting are unrelated to radiation from Japan and other nuclear sources in the Philadelphia area.

Are There Standards for Drinking Water Safety?

The federal drinking water standard for I-131 is 3 pCi/L and is based on a long term average, not a single day sample.

How Long Does it Stay in the Environment?

Iodine-131 is a short-lived radioactive element with a half-life of 8 days, meaning every 8 days it loses half of its radioactivity. Unlike some radioactive chemicals, it does not persist for a long time.

Are there elevated levels of any other kind of radioactive particle in Philadelphia drinking water? (I have seen cesium mentioned.)

None have been identified. PWD will be sampling for a variety of radionuclides to ensure that this is the case.